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ENDANGERED SPECIES

Technical Bulletin

Department of the Interior, U.S. Fish and Wildlife Service, Washington, D.C. 20204

Congress Reauthorizes and Strengthens the Endangered Species Act

Legislation that reauthorizes the Endangered Species Act through fiscal year 1992 and provides significant new protection was passed by Congress on September 26, 1988, and signed by President Reagan on October 7 (Endangered Species Act Amendments of 1988, Public Law 100-478). Among the major provisions of the legislation are increases in funding authorizations; a reinforced commitment to cooperative State programs; increased protection for listed plants; monitoring of listing candidates; monitoring of recovery plan implementation; a delay in the mandatory use by shrimp fishermen of Turtle Excluder Devices (TEDS); and new programs for the conservation of African elephants (*Loxodonta africana*). These and other changes in the Endangered Species Act are summarized below:

Endangered Species Act Funding

Congress authorized the appropriation of up to the following amounts in fiscal years 1990-1992 for activities of the Departments of the Interior, Commerce, and Agriculture relating to the Endangered Species Act: FY 1990, $46.65 million ($38 million for Interior, $6.25 million for Commerce, $2.4 million for Agriculture); FY 1991, $48.85 million ($39.5 million for Interior, $6.75 million for Commerce, $2.6 million for Agriculture); and FY 1992, $50.85 million ($41.5 million for Interior, $6.75 million for Commerce, $2.6 million for Agriculture). These figures, it should be noted, are authorization ceilings; the amounts *appropriated* for spending will be determined each year by Congress.

Cooperative State Programs

Recognizing the value of cooperative State endangered species programs, Congress amended the Act to establish a new source for Federal matching grants, the Cooperative Endangered Species Conservation Fund. General revenues in an amount equal to five percent of each year's total Pittman-Robertson (Federal Aid in Wildlife Restoration Act) and Wallop-Breaux (Federal Aid in Sport Fish Restoration Act) Federal Aid accounts will be deposited each year into the new Cooperative Endangered Species Conservation Fund. The Congressional Budget Office estimates that, under this formula, about $15 million annually will go to the Fund account, from which Congress can make appropriations for endangered species matching grants. The amendments also authorize States to use these grants for monitoring the status of listing candidates and recovered species as well as those species currently listed as Endangered or Threatened.

Protection of Listed Plants

The 1988 Endangered Species Act Amendments increase protection for listed plants on Federal, State, and private lands, and give the Fish and Wildlife Service an expanded role in enforcing import and export restrictions.

- Previously, the Act only made it illegal to "remove and reduce to possession" listed plants, and this applied only to those plants occurring on lands under Federal jurisdiction. The new law, however, includes a prohibition against "maliciously damaging or destroying" any such plants on Federal land.
- Another significant change is that the Act reinforces State plant protection laws. It is now illegal under the Act to remove, damage, or destroy any listed plant on State or private land in knowing violation of State law or in the course of violating a State criminal trespass law.
- The amendments also increase the number of Federal agencies that enforce restrictions on the import and export of plants protected by the Act or by the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). The Agriculture Department's Animal and Plant Health Inspection Service had exclusive authority in this area, but it will now share enforcement with the Fish and Wildlife Service.

Monitoring of Listing Candidates

The Fish and Wildlife Service has identified approximately 4,000 taxa (2,500 plants and 1,500 animals) for possible listing protection under the Endangered Species Act, and it already has enough data on about 950 of this total to warrant listing proposals. Currently, the Service has the resources to complete approximately 50 listings per year. To help prevent substantial declines or extinctions of candidates pending listing actions, Congress directed the Service to more closely monitor the status of these species and, if necessary, to promptly carry out emergency listings.

Congress also directed other Federal agencies to work with the Service to ensure that their programs help to protect listing candidates.

Recovery Planning and Implementation

The goal of the Endangered Species Act is to recover Endangered and Threatened species to a secure, self-sustaining status, and the 1988 amendments contain a number of provisions relating to recovery planning and implementation.

- One new requirement is for a report to Congress every 2 years on 1) the progress being made to develop and carry out species recovery plans and 2) the status of all species for which recovery plans have been developed. A tracking system will be set up to facilitate preparation of the report.
- Another provision requires the Secretary of the Interior to submit an annual accounting, on a species-by-species basis, of all "reasonably identifiable" expenditures for the conservation of listed species made by Federal agencies and by the States that receive matching grants. This primarily will be a listing of general information on costs related to recovery planning and implementation. It will also include atypically large expenditures associated with listing actions, Section 7 interagency consultations, research, and law enforcement.
- The amendments also require public notice of all drafts of new and revised recovery plans. Interested persons will have an opportunity to provide comments on the plans, and those comments will be considered before the plans are approved.

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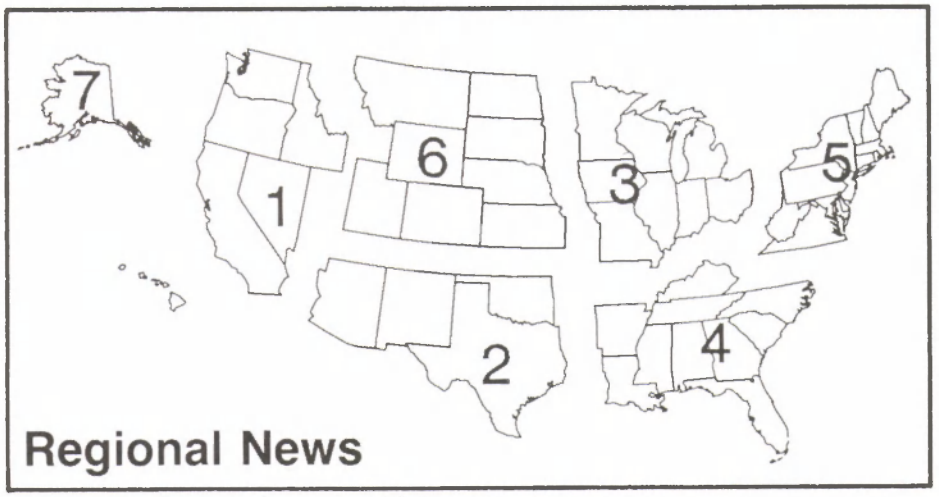

Regional News

Regional endangered species biologists have reported the following news and activities for October and November:

Region 1 — Representatives of the Fish and Wildlife Service (Service) and Bureau of Land Management (BLM) recently met to consider protection for Aasea's onion (*Allium aaseae*), an Idaho plant that is a category 1 candidate for listing under the Endangered Species Act. Proposed mining exploration could lead to the transfer of *A. aaseae* habitat on public lands to private ownership for mineral extraction. This population of Aasea's onion is considered to represent the far western edge of the species' range, and is particularly important for preserving the genetic integrity of the plant. As a result of the meeting, the BLM has agreed to protect about 20 percent of the known population. The BLM also will contact the mining company to discuss a possible land exchange to protect the plant, establish at least three Aasea's onion "preserves" on BLM land, and take the lead in negotiating with private landowners for the acquisition of three more preserves.

* * *

Staff of the Service's Sacramento, California, Field Office also met recently with representatives of the BLM, California Department of Fish and Game, California Department of Food and Agriculture, University of California-Riverside, Inyo County, and California Native Plant Society to discuss appropriate methods for the removal of a non-native plant, Russian thistle (*Salsola* sp.), from the Eureka Dunes. The invading thistle may be threatening two federally listed plants, the Eureka dunegrass (*Swallenia alexandrae*) and Eureka Valley evening—primrose (*Oenothera avita* ssp. *eurekensis*), that are endemic to the area. The BLM will consider providing funding to support experimental control of the thistle. Emphasis will be on manual controls, such as hand-pulling or cutting, in a manner that will not disturb the listed plants. No chemical controls will be employed. The Service will consider funding a multi-year monitoring effort to determine the extent of the potential problem and learn more about the ecology and invasive characteristics of the thistle.

* * *

Preliminary results from 1988 surveys for the least Bell's vireo (*Vireo bellii pusillus*) in southern California indicate that virtually all of the larger populations have increased significantly since 1987. Habitat protection, trapping of competing brown-headed cowbirds (*Molothrus ater*), and other management efforts for this Endangered subspecies appear to be paying off. The smaller populations (i.e., those less than 10), however, are still dangerously close to extirpation.

* * *

Negotiations with private landowners will soon begin for acquisition and reforestation of denuded areas of the Sacramento River bank between River Mile 0 at San Francisco Bay and 194 near Chico Landing, California. Such restoration would benefit the Threatened valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*). Riparian areas were removed by the Army Corps of Engineers during years of effort to contain the river flow. Habitat restoration will ultimately be accomplished on at least 668 acres in dis-

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U.S. Fish and Wildlife Service Regions

Region 1: California, Hawaii, Idaho, Nevada, Oregon, Washington, American Samoa, Commonwealth of the Northern Mariana Islands, Guam, and the Pacific Trust Territories. **Region 2:** Arizona, New Mexico, Oklahoma, and Texas. **Region 3:** Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, Ohio, and Wisconsin. **Region 4:** Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Puerto Rico and the U.S. Virgin Islands. **Region 5:** Connecticut, Delaware, District of Columbia, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, Virginia and West Virginia. **Region 6:** Colorado, Kansas, Montana, Nebraska, North Dakota, South Dakota, Utah, and Wyoming. **Region 7:** Alaska. **Region 8:** Research and Development nationwide.

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continuous, narrow strips bordering the river. Congressional funding for the program is based on a report completed in 1976. That report was recently updated to identify and rank suitable lands for acquisition by the California Wildlife Conservation Board. The California Department of Fish and Game will likely manage the lands following acquisition and restoration.

* * *

The second year of the California sea otter (*Enhydra lutris nereis*) translocation project began on September 27. Under more discriminating guidelines than those used last year, only young animals are being captured, immediately transported to San Nicolas Island, and promptly released. It is hoped that this will reduce stress and encourage otters to remain at the island. Many released otters are being fitted with radio transmitters attached to the external flipper tags. These tiny transmitters will allow researchers to monitor the animals' movements.

* * *

Region 2 — This past summer, the Socorro isopod (*Thermosphaeroma thermophilum*) had perhaps its closest brush with extinction in the past million years. Roots clogged the pipe leading to the cement horse-watering trough where the only known population of this tiny, water-dependent crustacean survived, thus drying the habitat. (Its natural habitat had already been lost.) The City of Socorro, New Mexico, subsequently removed the roots and restored the flow, but no isopods could be found. Fortunately, a refugium population had been established at the University of New Mexico under the guidance of Dr. Manuel Molles. Charles W. Painter, an endangered species biologist for the New Mexico Department of Game and Fish, has restocked 555 isopods into the renovated trough. If the refugium population had not existed, the Socorro isopod would now be extinct.

* * *

Joint efforts by the Service, New Mexico Department of Game and Fish, and U.S. Forest Service resulted in the transfer by helicopter of 375 Gila trout (*Salmo gilae*) from South Diamond Creek to two tributaries of the East Fork of Mogollon Creek. The original intent was to stock this Endangered fish directly into the East Fork of Mogollon Creek, which had been chemically treated this past summer to remove non-native species. Rainbow and brown trout (*Salmo gairdneri*and *Salmo trutta*) were still found in the creek, however, so it was re-treated. In early spring, the Gila trout will be moved from the two tributaries into the East Fork of Mogollon Creek.

* * *

The Service's Pinetop Fisheries Assistance Office in Arizona is undertaking a taxonomic evaluation of the Threatened Apache trout (*Salmo apache*). This rare fish is restricted to headwater streams and three small impoundments in the White Mountains of east-central Arizona. One of the threats to the Apache trout is hybridization with rainbow and cutthroat trout (*Salmo clarki*). This past summer, the Pinetop Office collected Apache trout from 31 streams throughout the species' range for electrophoretic and morphometric analyses. The information gained from these studies will help to discriminate between pure and hybrid Apache trout populations as well as to help maintain genetically pure and heterozygous hatchery stock.

* * *

On October 22, the Bureau of Reclamation presented the Arizona Native Plant Society with a "Take Pride in America" award. In presenting the award, Mr. Robert Towles thanked the Society for its volunteer efforts in assisting biologists of the Bureau and the Fish and Wildlife Service to salvage rare plants from the route of the Central Arizona Project, a large pipeline/canal water delivery system. Volunteers transplanted seedlings of an Endangered plant, the Tumamoc globeberry (*Tumamoca macdougalii*), onto preserves and monitored their survival. They also salvaged Thornber's fishhook cacti (*Mammillaria thornberi*) from the same route.

* * *

The surviving 38 plants of the reintroduced Kearney's blue star (*Amsonia kearneyana*) colony that was transplanted into a canyon in southern Arizona in April 1988 have produced buds that the Service hopes will result in stem growth next year.

* * *

The Attwater's Greater Praine Chicken (*Tympanuchus cupido attwateri*) Recovery Team met September 7 in Texas. Since 1970, the population of this Endangered bird has declined by an average of 90 birds per year. If this rate continues, it will become extinct in 1999. Habitat losses due to changes in land use and management are believed to be causing the decline. The 1988 spring population was 926 birds in 8 counties, but only 3 counties have populations exceeding 34 birds. Drought is accelerating the population decline and small relict populations could disappear from five counties in the next few years. The team recommended that a captive propagation program be initiated to restock suitable unoccupied habitat. This proposal is under review by the Service's Region 2 and the Texas Parks and Wildlife Department.

* * *

The Service has received an interim report from Texas Parks and Wildlife on its golden-cheeked warbler (*Dendroica chrysoparia*) status survey. So far, Texas biologists have collected data on golden-cheeked warbler densities and vegetation characteristics at 11 study sites and estimated available warbler habitat using a geographic information system and LANDSAT data. The authors also plan to use satellite data to look at the rate of habitat change. They will be refining the

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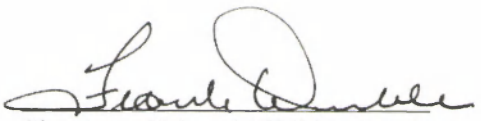
TAKE PRIDE IN AMERICA

Taking Pride in Our Rarest Resources

This edition of the *Endangered Species Technical Bulletin* contains a Regional News note about volunteers in Arizona who illustrated the *Take Pride in America* spirit by assisting biologists of the Fish and Wildlife Service and Bureau of Reclamation in relocating some endangered plants from the path of a large aqueduct construction project to protected areas. I commend these concerned citizens for their efforts. Taking pride in our Nation's public lands and natural treasures includes taking resourceful and creative measures to protect rare animals and plants. Conserving these vulnerable resources is a job that government agencies cannot do alone, and the active assistance of people from all segments of society is needed. Remember, this land is *your* land.



Director, Fish and Wildlife Service

Protection Recommended for Three Plants and One Insect

Four rare species—three plants and one insect—were proposed by the Fish and Wildlife Service in October and November of 1988 for listing as Threatened or Endangered. If these proposals are made final, Endangered Species Act protection will be extended to the following:

Prairie Fringed Orchids

Two closely related species of grassland orchids have been proposed for listing as Threatened (F.R. 10/11/88). The **eastern prairie fringed orchid** (***Platanthera leucophaea***) occurs primarily east of the Mississippi River, while the **western prairie fringed orchid** (***Platanthera praeclara***) is restricted to States west of the Mississippi. Until recent years, they were thought to comprise a single species.

Prairie fringed orchids are perennial herbs that regenerate in May from a tuberous rootstock. Showy clusters of up to 40 white flowers appear from late June to early July, arranged on an inflorescense that can reach 47 inches (12 decimeters) in height. The blossoms are fragrant after sunset and adapted to pollination by night-flying hawksmoths. Because of the attractive floral displays, some populations of prairie fringed orchids have been reduced by collectors.

The main threat to these orchids, however, is the modification of their prairie habitat. Grazing and intensive mowing of native grasslands for hay production prevent orchid flowering and seed dispersal unless limited to seasons when the species are dormant. Because the prairie fringed orchids need open, sunny habitat, they also are affected when the suppression of wildfires promotes encroachment on grasslands by brushy vegetation. Other former orchid habitat has been converted to cropland, and some wetland sites that supported the eastern species have been drained.

The western prairie fringed orchid has declined 60 percent from the historical levels indicated in county records. It apparently has been extirpated from South Dakota. Forty populations are known to remain within remnants of tallgrass prairies in: North Dakota (1), Minnesota (9), Iowa (13), Kansas (8), Nebraska (5), Missouri (2), and Oklahoma (2), and the species was recently discovered in Manitoba, Canada. Many of the surviving populations, however, are small. One of Nebraska's two populations is on Valentine National Wildlife Refuge, but it numbers fewer than 20 individuals and its open habitat is undergoing vegetative succession. North Dakota's single population, consisting of 1,000-2,000 plants, is on the Sheyenne Valley National Grassland, which is managed by the U.S. Forest Service for grazing. Research is under way to determine how current management is affecting the orchid.

The eastern prairie fringed orchid has declined over 70 percent from levels described in original county records. Recent surveys located 51 surviving populations in: Michigan (18), Illinois (18), Wisconsin (10), Ohio (2), Maine (1), Iowa (1), and Virginia (1). Populations also are known from Ontario and New Brunswick, Canada. This species has not been seen recently in Oklahoma, Indiana, Pennsylvania, New Jersey, and New York, and it may be extirpated from these States.

Listing the prairie fringed orchids under the Endangered Species Act would complement the protection these plants already receive from nine of the States within their range. Under Section 7 of the Act, Federal agencies would be required to determine if their activities—including grazing management programs—are affecting the orchids. Cooperative discus-

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photo by Donald R. Kurz, Smithsonian Collection

eastern prairie fringed orchid

sions among representatives of the Fish and Wildlife Service, the U.S. Forest Service, and the Sheyenne Valley Grazing Association have already begun. One possibility being considered is whether or not grazing, if managed to avoid seasons of orchid growth and flowering, may benefit the species by helping to keep its grassland habitat open.

Shale Barren Rock Cress (*Arabis serotina*)

Shale barrens are "islands" of unique habitat within the central Appalachian woodlands that are characterized by sparse vegetative cover, steep south-facing slopes, and high temperatures with low moisture in the summer. Eighteen endemic plant taxa are recorded from the shale barrens, including *Arabis serotina* and three other candidates for listing under the Endangered Species Act (*Allium oxyphilum*, *Taenidia montana*, and *Trifolium virginicum*).

The shale barren rock cress is a biennial herb in the mustard family (Brassicaceae). Populations usually consist of two age-classes: 1) young, nonreproductive individuals in a basal rosette form and 2) erect, second-year flowering plants. At maturity, *A. serotina* grows to a height of one to two feet and produces a spreading, compound inflorescence bearing many tiny whitish flowers.

Currently, the shale barren rock cress is known from only 26 populations in 5 Virginia counties (Allegheny, Augusta, Bath, Highland, and Rockbridge) and 3 West Virginia counties (Greenbrier, Hardy, and Pendleton). Five of the shale barrens supporting the species in West Virginia have been damaged by road construction and a sixth was degraded by a small flood-control dam. Two of West Virginia's populations also were grazed in the past by sheep or goats. In Virginia, three shale barrens were almost destroyed by road building, two were degraded by railroad construction, and one is crossed by a hiking trail.

The two main threats currently facing *A. serotina* are the small size of most populations and browsing of the plants by deer. A 1986 status survey revealed that 15 populations of the shale barren rock cress numbered 20 or fewer individuals of flowering age. Some colonies have been heavily browsed by white-tailed deer, which are increasing in Virginia and West Virginia. Because the plant is a biennial and is restricted to a stressful environment, its reproductive potential already is naturally limited. Increased pressure from deer or other threats could make it impossible for *A. serotina* to survive. Accordingly, the shale barren rock cress has been proposed for listing as Endangered (F.R. 11/17/88).

The U.S. Forest Service, with 16 populations partially or completely within the George Washington and Monongahela National Forests, supports listing the shale barren rock cress. Conserving the specialized habitats where this plant occurs is not expected to significantly affect the agency's forest management.

American Burying Beetle (*Nicrophorus americanus*)

Also known as the giant carrion beetle, this flying insect is the largest member of its genus in North America, measuring up to about 1.5 inches (3.6 cm) in length. In addition to its size, the species is distinguishable from other species in the genus by a large orange/red spot on its upper back. Other orange/red markings on the front of the head, antennal clubs, and wing covers also contrast sharply with the species' black background.

As its common names imply, this beetle collects carrion and carries it below ground. Apparently any vertebrate carrion between 1.8 and 7.1 ounces (50 and 200 grams) is acceptable, although the beetles also capture and consume live insects. Beetles of both sexes are attracted to appropriate carrion soon after dark, and they will apparently fight among themselves until a dominant pair remains. This pair then will claim the carcass and bury it before dawn. After a chamber is constructed, eggs are laid on the carrion, which the hatching larvae will consume as food.

This beetle once was widely distributed throughout North America. It was reported from 32 States, the District of Columbia, and 3 Canadian provinces. For unknown reasons, however, the species has experienced a catastrophic decline. It is now known to survive at only two locations, a small island off the New England coast and a site in eastern Oklahoma. In its 1983 *Invertebrate Red Data Book*, the International Union for the Conservation of Nature and Natural Resources said the American burying beetle has exhibited "... one of the most disastrous declines of an insect's range ever recorded."

American burying beetle

Although several hypotheses have been advanced, there is no proof as to what has eliminated *N. americanus* from most of its range. This lack of knowledge obviously makes conservation and recovery planning difficult. If this beetle is listed, initial recovery efforts will focus on research to determine the factors responsible for its decline. If the problem(s) can be identified, later efforts could include moving beetles to reestablish populations at other sites within the species' former range. Continued surveys for any other populations that may remain are planned.

Conservation Measures Authorized by the Endangered Species Act

Among the conservation benefits provided to a species if its listing under the Endangered Species Act is approved are: protection from adverse effects of Federal activities; restrictions on take and trafficking; the requirement for the Service to develop and implement recovery plans; the authorization to seek land purchases or exchanges for important habitat; and the possibility of Federal aid to State or Commonwealth conservation departments that have signed Endangered Species Cooperative Agreements with the Service. Listing also lends greater recognition to a species' precarious status, which encourages further conservation efforts by State and local agencies, independent organizations, and individuals.

Section 7 of the Act directs Federal agencies to use their legal authorities to further the purposes of the Act by carrying out conservation programs for listed species. It also requires these agencies to ensure that any actions they authorize, fund, or carry out are not likely to jeopardize the survival of a listed species. If an agency finds that one of its activities may affect a listed species, it is required to consult with the Service on ways to avoid jeopardy. For species that are *proposed* for listing and for which jeopardy is found, Federal agencies are required to "confer" with the Service, although the results of such a conference are nonbinding.

Further protection is authorized by Section 9 of the Act, which makes it illegal to take, possess, transport, or engage in interstate or international trafficking in listed animals except by permit for certain conservation purposes. For plants, it is unlawful to collect or maliciously damage any listed species found on lands under Federal jurisdiction. Removing or damaging listed plants on State and private lands in knowing violation of State law or in the course of violating a State criminal trespass law also is illegal under the Act. In addition, some States have their own more restrictive laws specifically against the take of State or federally listed plants.

Undercover Investigation Breaks Rhino Horn Trafficking Ring

Michael D. Rees
Division of Endangered Species and Habitat Conservation
Washington, D.C.

What is believed to be a significant international group trafficking in the black market for rhino horns has been uncovered in the United States. As of February 2, 10 people had been indicted on a variety of charges relating to the illegal importation and sale of rhinoceros horns and other parts of endangered wildlife species, as well as Communist-bloc AK-47 machine guns, into the United States. Three South Africans were among the 10 individuals charged in the conspiracy. (The U.S. Attorney is working with the U.S. Departments of Justice and State to extradite the South Africans.) The indictments culminated an 8-month undercover investigation involving agents from the Fish and Wildlife Service, Customs Service, and Bureau of Alcohol, Tobacco and Firearms.

The investigation began in February 1988, when the Fish and Wildlife Service learned that one of the defendants was attempting to sell a leopard (*Panthera pardus*) mount. Between April and June, an undercover agent was sold two leopard rugs for $2,000, a leopard head mount for $550, and a cheetah (*Acinonyx jubatus*) rug and cheetah head for $2,400. These sales were in violation of both the Endangered Species Act and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

One of the defendants subsequently indicated that he could obtain an "unlimited" number of rhino horns. The defendants agreed to sell five to seven rhino horns to the Service undercover agent for $40,000 each. One 8-pound horn was sold to the agent in August for $40,000. At the time of his arrest, one of the defendants had two rhino horns in his possession that were obtained in Angola. Recorded telephone conversations revealed that two of the defendants had obtained a total of 14 rhino horns in Angola, and that these horns were being transported to Namibia (Southwest Africa) from Angola via South African military vehicles for subsequent shipment to the United States.

Reports received by the Fish and Wildlife Service during the past year indicate that members of the South African Defense Force on duty in Angola and Namibia have been killing and smuggling rhinos, African elephants (*Loxodonta africana*), and other wildlife for personal gain. This investigation confirmed those allegations.

Rhino horn is not actually a horn but a growth of densely packed fibers of keratin, the same kind of protein that makes up human hair and fingernails. The horns weigh an average of 6 to 7 pounds and are from 1 to 3 feet in length. They are used primarily as handles for ceremonial daggers in some Arab countries, and in powdered form in Asia as a fever reducer and an aphrodesiac. Rhino horn is sold on the black market throughout the world. Published reports indicate that a rhino horn usually sells in the United States for

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Fish and Wildlife Service photo

Evidence seized during the investigation included illegally imported rhinoceros horns, spotted cat trophies, and AK-47 machine guns.

photo by Bruce F. Wolke, courtesy of the World Wildlife Fund-U.S.

The black rhinoceros population has plummeted from over 65,000 in 1970 to fewer than 4,000 today, and the illegal killing of this Endangered animal for its "horn" continues at an alarming pace.

Rhino Horn

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$450 an ounce—about the price of gold. In some countries in the Middle East and eastern Asia, the price has been reported to approach $1,000 per ounce.

Rhinocerous populations in Africa have been decimated by poaching in recent years. The black rhino (*Diceros bicornis*) of Africa, from which the horns involved in this case are believed to have come, numbered over 65,000 in 1970. By 1985, the population had shrunk to 11,000, and today fewer than 4,000 of these rhinos remain. The population is estimated to decline by half every 4 to 5 years. Some have been collected for captive breeding, but many people believe the species could shortly become extinct in the wild.

All species of rhinos are on Appendix I of CITES, to which both the United States and South Africa are signatory countries. Pursuant to this treaty, the importation of a rhinocerous, or any part thereof, into the United States is illegal without the proper permits from the U.S. and the exporting country. Except for the southern population of the white rhino in Africa, all rhinos of Africa and Asia also are listed as Endangered under the U.S. Endangered Species Act.

Rhino experts have stressed the need for 1) greater international cooperation to stop illegal trade, 2) improved management of major rhino populations, and 3) protected sanctuaries if the rhino is to survive in the wild.

Federal Investigation Documents Illegal Trade in Rare Parrots

The U.S. Fish and Wildlife Service recently concluded "Operation Psittacine," a 2-year investigation that documented extensive illegal importation of parrots from Mexico and Central and South America into the United States. Information gathered during the investigation indicated that as many as 26,000 birds per year are smuggled across the U.S./Mexico border near Brownsville, Texas, alone.

This was the first major covert effort by the Service to target illegal parrot dealers operating away from the country's border areas. Agents from six districts of the Fish and Wildlife Service's Law Enforcement Division and U.S. Customs Service worked on the investigation. The agents represented themselves as bird buyers for a local chain of pet stores in Dayton, Ohio, which cooperated with the investigation. This enabled the agents to document the activities of illegal parrot dealers. As a result of this investigation, 36 people in 6 States (Indiana, Missouri, Illinois, Wisconsin, Texas, and California) will be prosecuted for felony violations of Federal smuggling statutes and the Lacey Act. The Lacey Act is aimed at preventing illegal trade in protected wildlife.

Smuggled parrots valued at an estimated $468,000, along with an airplane and vehicles valued at $93,000, were seized during the investigation. The confiscated birds included scarlet macaws (*Anodorhynchus macao*), palm cockatoos (*Probosciger aterrimus*), thick-billed parrots (*Rhynchopsitta pachyrhyncha*), and several other parrot species (*Amazona* sp.). Trade in these species is regulated under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). The thick-billed parrot also is protected under the Endangered Species Act.

The smuggling of parrots is not only a threat to wild parrot populations but also to birds in the United States. Smuggled parrots are not put through normal quarantine procedures and can carry the highly contagious Newcastle's disease. This viral disease can infect poultry and other bird species.

photo by Jorgen Bent Thomsen, courtesy of the World Wildlife Fund-U.S.

palm cockatoo

Black-footed Ferrets Moved to New Facilities

Sharon Rose
Public Affairs Assistant
Denver Regional Office

The black-footed ferret (*Mustela nigripes*) moved a step closer to recovery following a decision by Fish and Wildlife Service and State of Wyoming endangered species authorities to take animals from the world's only known black-footed ferret population and establish two additional captive breeding populations.

Following 2 successful years of captive breeding at the Sybille Wildlife Research and Conservation Education Unit near Wheatland, Wyoming, during which the black-footed ferret colony grew from 18 to 58 captive animals, officials worried that a catastrophe, such as a fire or disease, might wipe out the entire colony. To prevent this, the Wyoming Game and Fish Department began a systematic search for institutions having suitable expertise, caging structures, and willingness to assist with the captive-breeding program.

After a series of studies and interviews, two facilities were deemed best qualified to house ferrets from the Sybille colony: the National Zoological Park's Conservation and Research Center in Front Royal, Virginia, and the Henry Doorly Zoo in Omaha, Nebraska. Officials at both zoos have agreed to cover all expenses related to the care and breeding of the captive ferrets while in their care. The Wyoming Game and Fish Department, through the Sybille Unit, agreed to supply each zoo with a total of 20 individuals (10 males and 10 females) for each breeding program. With the establishment of these new breeding populations, the hope is to reach a total of 250 breeding pairs, or 500 individual animals, by 1991.

Preparations were begun in the summer to establish the new population at Front Royal. Seven young ferrets from the Sybille Unit, born in 1988, were carefully selected to ensure that the new population would represent a a substantial portion of the gene pool of the original population captured at Meeteetse, Wyoming. Complicating the move was the susceptibility of the ferrets to canine distemper, human influenza, and other diseases. The ferrets at the Sybille Unit have been raised in isolation during the last few years for this reason. Transporting the animals to Virginia in a commercial carrier that frequently transports pets could have exposed the ferrets to distemper and human influenza. With this concern in mind, permission was sought from the Department of Defense to enable the Wyoming Air National Guard to airlift the ferrets to Virginia. This permission was granted.

On October 18, 1988, a cool, wet morning, seven ferrets (four females, three males) were moved in specially constructed boxes by ground transportation from Sybille to Cheyenne, Wyoming. The animals were monitored by attendants wearing masks to prevent the possible spread of disease. A C-130 plane from the Wyoming Air National Guard's 153rd Tactical Airlift Group, on its way to Virginia for a training mission, flew the ferrets and staff from the Wyoming Department of Fish and Game and the Service to Andrews Air Force Base in Maryland. The ferrets were then driven to Front Royal. All the ferrets made the trip safe and sound and are doing well in their new residence.

Special accommodations for the ferrets' new home in Virginia included wooden "houses" similar to those they had occupied in Wyoming, placed in the ferrets' new outdoor enclosures. Each enclosure, measuring 10 x 20 feet or larger, has a concrete floor covered with 6 to 10 inches of pine bark, peat moss, and solite. The roof of the enclosure is a corrugated plastic that allows light to pass through, but keeps out rain, snow, and attacks by great horned owls, which have been known to make a meal out of a ferret.

Yards of black, flexible tubing for the ferrets to use as "tunnels" throughout the enclosure lie on top of the floor. Zoo officials are experimenting with leaving the tubing on top of the soil for easier observation, but if the ferrets seem hesitant to use it this way, it will be buried. Each enclosure has a circular opening in the wall that allows entry into an adjoining "room." The opening can be closed when not needed.

Eight ferrets (4 males and 4 females) from Sybille were successfully moved on December 15 to establish the third captive breeding population in Omaha. The Omaha zoo is in the process of building a new facility to hold the ferrets.

The first release of black-footed ferrets into the wild may occur in 1991. In preparation for this event, an Interstate Coordinating Committee has set up individual State working groups in Regions 6 and 2 of the Service. Each State working group includes members from the State natural resources agency, State game and fish department, and such Federal agencies as the Forest Service, Bureau of Land Management, Soil Conservation Service, Fish and Wildlife Service, military, and any other agency that has a stake in prairie dog management.

Each State working group is charged with the mapping of prairie dog colonies to aid in identifying possible ferret relocation sites. Once identified, the sites will be evaluated and a management plan will be developed to protect these areas.

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(continued from page 3)

habitat description and estimate of available habitat before submitting their final report.

The golden-cheeked warbler's habitat, which consists of mixed evergreen-deciduous forests, is most abundant and contiguous on the eastern edge of the Edwards Plateau in Texas. The birds depend on ashe juniper (*Juniperus ashei*) for nesting material and require stands more than 20 years old for nesting. Oak (*Quercus* spp.) trees apparently provide essential foraging substrate. After the habitat estimates are refined, the authors will use this information in combination with their density estimates to calculate the population size. The Service will evaluate the final information to determine whether or not to propose listing the golden-cheeked warbler for Endangered Species Act protection.

* * *

Region 4 — The National Park Service, in cooperation with the North Carolina Wildlife Resources Commission, has reintroduced 250 spotfin chubs (*Hybopsis monacha*) into historical habitat in Abrams Creek, Tennessee, within the Great Smokey Mountains National Park. The reintroduction was successful, and subsequent observations indicate that the fish are still in the transplant area. All of the transplanted fish were collected from the Little Tennessee River in North Carolina.

Current plans are to make additional transplants annually over the next 4 years. If the Abrams Creek reintroduction effort continues to be successful, it will increase the overall number of spotfin chub populations from four to five. The Spotfin Chub Recovery Plan calls for at least six viable populations before the species can be considered for removal from Endangered Species Act protection.

* * *

The Service has been petitioned to list the Louisiana black bear (*Ursus americanus luteolus*) as Endangered. There is a question, however, about whether or not genetically pure individuals of this subspecies remain. In the 1960's, black bears of a different subspecies (*Ursus americanus americanus*) were introduced from Minnesota into Louisiana for sport hunting purposes after the native subspecies had declined. To answer questions about the genetics, the Service has contracted with Dr. Mike Pelton of the University of Tennessee to coordinate the gathering, processing, and interpretation of black bear data in Louisiana. Blood and tissue samples are being collected from bears in the Tensas and the Atchafalaya River basins in Louisiana. Electrophoretic and mitochondrial DNA techniques will be employed in conducting the investigation.

(continued on next page)

Final Listing Rules Approved for Three Species

Michael Rees

During October and November of 1988, one plant and two animal species were added to the Federal list of Endangered and Threatened Species. The following now receive protection under the Endangered Species Act:

Decurrent False Aster (*Boltonia decurrens*)

This wet prairie perennial, a member of the family Asteraceae, grows up to 79 inches in height and produces clusters of attractive aster-like flowers with yellow disks and white to (more commonly) purple rays. Historically, this plant was known to occur along a 250-mile stretch of the Illinois River floodplain from LaSalle, Illinois, downstream to St. Louis, Missouri, where it also grew along the Mississippi River. Seventeen populations are now known to occur in five Illinois counties, and there are two populations in one Missouri county. The aster is believed extirpated from 13 other counties in Illinois and 3 counties in Missouri. It is threatened by destruction and modification of the floodplain forest along the two rivers due to wetland drainage and agricultural expansion. The main threat to the species is heavy siltation, resulting from extensive row crop cultivation and altered flooding regimes. The decurrent false aster was proposed on February 25, 1988, for listing as a Threatened species (see summary in BULLETIN Vol. XIII, No. 3), and the final rule was published November 14, 1988.

Little-wing Pearly Mussel (*Pegias fabula*)

The little-wing pearly mussel, the only member of its genus, is a small freshwater mollusk. It inhabits small, cool, free-flowing streams and is usually found in the transition zone between pools and riffles. Of the 27 river reaches in Alabama, North Carolina, Kentucky, Tennessee, and Virginia in which this species once occurred, only 6 (3 in Kentucky, 2 in Virginia, and 1 in Tennessee) are still known to support the mussel. This species' decline has resulted primarily from habitat deterioration and modification caused by impoundments and by mining, agricultural, and construction runoff. Four of the six populations are threatened by coal mining and/or oil and gas development, and all of the populations are vulnerable to toxic spills and other accidents that could affect water quality. It is likely that most of the remaining populations have fallen below the generally accepted level required to maintain long-term genetic viability. The little-wing pearly mussel was proposed for listing as an Endangered species on April 21, 1988 (see summary in BULLETIN Vol. XIII, No. 5), and the final rule was published on November 14, 1988.

California Freshwater Shrimp (*Syncaris pacifica*)

This crustacean, the only surviving member of its genus, is nearly transparent in water and can reach 2.5 inches in length. The species is endemic to gentle gradient, low elevation freshwater streams in Napa, Marin, and Sonoma Counties, California. Once common, it now occurs only within restricted portions of 12 streams. The shrimp is threatened by introduced predatory fish and deterioriation or loss of habitat resulting from water diversion, stream channelization, dam construction, livestock grazing, agricultural and residential development, and water pollution. On April 22, 1987, the California freshwater shrimp was proposed for listing as an Endangered species (see BULLETIN Vol. XII, No. 5-6), and on October 31, 1988, the listing was made final.

BULLETIN Available by Subscription

Although we would like to send the BULLETIN to everyone interested in endangered species, budgetary constraints make it necessary for us to limit general distribution to Federal and State agencies and official contacts of the Endangered Species Program. However, the BULLETIN is being reprinted and distributed to all others, on a non-profit subscription basis, by the University of Michigan. To subscribe, write to the *Endangered Species Technical Bulletin Reprint*, School of Natural Resources, University of Michigan, Ann Arbor, Michigan 48109-1115, or telephone 313/763-1312. The price for 10 issues is $15.00 (in Canada, $18 US).

Regional News

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These data will be interpreted in the context of other available black bear data, including samples from Minnesota bears.

* * *

The Service's Asheville, North Carolina, Field Office and the North Carolina Natural Heritage Program have conducted field surveys in North and South Carolina for Schweinitz's sunflower (*Helianthus schweinitzii*). Two populations of this Category 1 listing candidate have been decimated by quarrying and road construction. However, 5 previously unknown populations were discovered during the surveys, bringing the rangewide total to 16. Schweinitz's sunflower depends on periodic disturbances, such as fire, to maintain its open habitat. Because of several decades of fire suppression, the species is confined to habitat remnants adjacent to powerlines and highway rights-of-way, where the natural disturbance regime is artificially duplicated by maintenance operations.

* * *

The drought of 1988 appears to have harmed many populations of the Endangered green pitcher plant (*Sarracenia oreophila*), a species that occurs in boggy areas. Populations in northeast Alabama were visited by the Service's Jackson, Mississippi, Field Office botanist in October, and many showed a reduction in seed production. The effects of the drought were most evident on the recently reestablished green pitcher plant population in the Coosa Valley region of Alabama. Because of inadequate rainfall following the planting of seedlings in May, there was over 80 percent mortality. Additional seedlings from the greenhouse at the University of Georgia were planted at the site this fall and their status will be evaluated in spring 1989.

Region 6 — The Service recently issued an Interim Wolf Control Plan to manage potential gray wolf (*Canis lupus*)-livestock conflicts as part of the recovery effort outlined in the revised Northern Rocky Mountain Wolf Recovery Plan. Although studies have shown that the percentage of livestock killed by gray wolves is low where their ranges overlap, the possibility of predation on livestock remains. The main objectives of the wolf control plan are to: (1) provide uniform interagency guidelines for determining and controlling problem wolves, and (2) guide managers in making prompt and responsible decisions on wolf control by integrating wolf recovery objectives with other land uses and values.

The interim control plan includes guidelines for determining problem wolf status, conducting wolf control actions, and deciding the ultimate disposition of problem wolves in Montana and Wyoming.

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New Hope for Survival of the 'Alala

Thane K. Pratt
Hawaii Department of Land and Natural Resources

On June 11, 1988, a tiny hatchling crow emerged from its egg, marking a turning point in the program to breed in captivity the critically endangered 'alala or Hawaiian crow (*Corvus hawaiiensis*). Named "Ho'oku," a Hawaiian word meaning "to continue [in the perpetuation of a lineage]," the 'alala chick does indeed inspire new hope for a species that numbers nine birds in captivity and perhaps fewer in the wild.

Although now extremely rare, the 'alala was once abundant in the forests along the leeward slopes of the island of Hawaii (and, prehistorically, Maui). The species' decline has been blamed on a variety of factors, including killing of the birds, deforestation, and avian diseases transmitted by mosquitos that have become established on the island. By the late 1970's, only 76 'alala were estimated to survive in remote mountain forests.

Concerned for the plight of the 'alala, Jon Giffin, a biologist with the Hawaii Department of Land and Natural Resources (DLNR), David Jenkins of the University of Wisconsin, and C. J. Ralph of the U.S. Forest Service began field studies to determine the causes of the species' decline. They discovered that, although most adults survived from one year to the next, the birds' poor productivity was responsible for the population's collapse. Data revealed low hatching rates and losses of young birds to disease and predators. Fearing that the 'alala population would not last much longer, biologists collected young 'alala that were suffering from disease or vulnerable to predators. These birds became the nucleus for a captive flock stationed at Pohakuloa, a bird propagation facility operated by the DLNR and situated between high volcanic peaks on the island of Hawaii.

While the wild population continued to plummet, initial optimism that the captive flock would reproduce dampened as these birds, too, showed little success at breeding. Over a 10-year period, the captive flock produced only three offspring, all from one nest in 1981. Alarmed by this lack of success, the State in 1984 hired a consultant, Dr. Fern P. Duvall II, to study and take charge of the 'alala breeding program. The State also decided to move the captive 'alala flock away from Pohakuloa. Duvall soon discovered that the high altitude of the site and disturbance from a nearby military training camp made the Pohakuloa facility unsuitable to the birds. Another consultant, Stanley Temple, had earlier recommended that a new facility be established at an abandoned prison facility at Olinda on the island of Maui. Elaborate new aviaries were constructed there in 1986 with the help of the U.S. Army, and the Fish and Wildlife Service contributed funds through the Endangered Species and Pittman-Robertson Acts.

In November 1986, the captive flock was transferred to its new quarters. Though the 'alala began to settle in well at Olinda, the 1987 breeding season arrived before the birds had fully adjusted to their new surroundings. Only two eggs were produced, and tragedy struck when one of the females died of complications resulting from egg laying. Meanwhile, a census of the wild population turned up only two birds, although a few others were thought to survive in areas inaccessible to researchers.

Thus, the 1988 breeding season began with considerable apprehension. Concerned that certain pairs had become incompatible, Duvall rematched all eight birds. In all but one pair, the birds accepted their new partners and began the breeding season on schedule, actively courting. By late April, the two older and experienced females (Mana and Lu'ukia), assisted by their mates, had completed their nests. Both females laid a clutch of eggs, which were placed into an incubator for safe hatching. Discovering their losses, both females then refurbished their nests and laid second clutches. These eggs also were removed, with immediate replacement by wooden ones. Eventually, Lu'ukia laid a third clutch of three eggs.

Never before had the captive flock produced so many eggs in one season. Unfortunately, the three eggs laid by Mana proved to be infertile. This was not unexpected because this female has a history of laying infertile, often deformed eggs. Lu'ukia did much better; the eight eggs examined were all fertile. (Two of her eggs disappeared in the nest and probably were eaten by one of the parents.) The two fertile eggs of Lu'ukia's first clutch continued to develop up to the projected hatching date, which arrived and passed without the emergence of a chick. The death of both eggs at this critical stage was an unexpected setback, but it caused Duvall to reconsider the incubation temperature that had been recommended on the basis of past experience with this species. When it was clear that the two eggs from Lu'ukia's second clutch were developing properly, Duvall moved one to a different incubator and raised the temperature by a fraction of a degree. To the delight of all involved, a baby crow hatched from the experimental egg, confirming that the new temperature was correct. The other egg failed. Lu'ukia's third clutch also did not hatch; the eggs showed signs of developmental stress, probably because of coming so late in the breeding season.

Meanwhile Ho'oku, the first chick, flourished on a diet of bee pupae, baby rats, and other selected food items. Though now fully grown, the bird will not become sexually mature until it is 2 1/2-years-old. It will then exhibit the social behaviors characteristic of its sex, and biologists will be able to determine its gender.

Reflecting on the events of the 1988 breeding season, DLNR biologists feel more confident about the captive breeding project. However, the fate of the 'alala is still uncertain because of the very small number of females. If the program continues to be successful and a captive population becomes firmly established, biologists can begin efforts to return birds to the wild. The breeding season began again on February 1, so watch and hope for more good news on the 'alala.

photo by Dr. Fern P. Duvall II

Ho'oku, the first 'alala produced in a captive propagation facility since 1981, represents new hope for the survival and eventual recovery of this critically endangered species.

Reauthorization

(continued from page 1)

Turtle Excluder Devices (TEDS)

TEDS are devices that are inserted into shrimping trawls to deflect sea turtles out of the nets and prevent these air-breathing reptiles from drowning. Because incidental drowning in nets is believed to have a significant impact on sea turtle populations, regulations requiring the use of TEDS at certain times in certain waters have been developed. (See BULLETIN Vol. XII No. 4 and Vol. XII No. 9.)

- Controversy about TED requirements resulted in an amendment that delays until May 1, 1989, the time when shrimpers must begin using the devices in offshore waters. Implementation in in-shore waters (bays and sounds landward of the coastline) is postponed until May 1, 1990. Regulations already in place for the Cape Canaveral area of Florida, however, remain in effect.
- The amendments also require the Department of Commerce to contract with the National Academy of Sciences for an independent review of scientific information on TEDS and sea turtle conservation in general. The target date for completion of the review is April 1, 1989. On the basis of this review or any new information, the Secretary of Commerce may modify the TEDS regulations as appropriate.

Pesticides Labelling

Concerns have been raised about the possible impacts of agricultural pesticides on listed species and about potential changes in regulations affecting pesticide use. Several of the new amendments address these concerns:

- The Environmental Protection Agency (EPA), in cooperation with the Departments of Agriculture and the Interior, is directed to set up a system for informing farmers of any proposed pesticide labelling programs or requirements that may be imposed in compliance with the Endangered Species Act. The public will have an opportunity to review and comment on any such programs or requirements. Labelling could affect how, when, and where certain pesticides are used.
- Congress also required the EPA to work with the Departments of Agriculture and the Interior to conduct a study to identify reasonable and prudent alternatives for implementing the labelling program without pesticide bans. A report is due to Congress within one year of the amendments.

Penalties and Enforcement

Congress more than doubled the civil and criminal fines for willful violation of the Act. The previous penalties had not been changed since 1973.

- Civil penalties jump to a maximum of $25,000 in the case of Endangered species and $12,000 for Threatened species.
- Criminal penalties are increased to a maximum of $50,000 for Endangered species and $25,000 for Threatened species.
- If the amount of funds collected from penalties, fines, and forfeitures of property exceeds $500,000, the excess will be added to the new Cooperative Endangered Species Conservation Fund.

African Elephants

In 1978, the African elephant was listed by the United States as a Threatened species. Limited importation of elephant ivory has been allowed since that time under Endangered Species Act and CITES permits. African elephant populations continue to decline, however, due primarily to poaching for the uncontrolled trade in illegally taken ivory. Because of growing concern about the survival of this impressive animal, Congress passed an African Elephant Conservation Act and appended it as Title II to the Endangered Species Act. The measure authorizes a special U.S. fund to provide assistance to African governments in elephant research, management, and conservation activities. It also requires the Department of the interior to review existing conservation programs in Africa and restrict trade in ivory from countries that have inadequate conservation systems or that are not complying with CITES requirements.

- There will be a complete moratorium on ivory trade from any *source* country that 1) is not a party to CITES; 2) is a party but is not adhering to CITES rules; or 3) is not effectively managing its elephants.
- There also will be a complete moratorium on ivory from any *intermediary* country that 1) is not a party to CITES; 2) does not adhere to CITES controls; 3) imports ivory from a non-party; or 4) imports ivory from a source country that is under moratorium.
- Congress authorized the appropriation of up to $5 million annually for implementation of the African elephant amendments and for the African Elephant Conservation Fund, although no funds have been appropriated yet. The Fund also can receive private donations, civil and criminal fines collected for violation of the African elephant amendments, and money from sales of ivory forfeited under the Act.
- The Secretary of the Interior is required to gather information on the elephant conservation programs of all ivory-producing countries and report to Congress annually on the status of the African elephant, the elephant conservation projects funded, and the effectiveness of the international ivory control system.
- Violators of the elephant protection provisions face a maximum civil penalty of a $5,000 fine; for a criminal violation, the penalty can be as high as a $200,000 fine and one year in jail.

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The goal of control actions will be to take the minimum number of wolves necessary to resolve wolf-livestock conflicts while progressing toward wolf recovery. The interim plan is designed to promote wolf conservation by demonstrating that responsible Federal agencies can act quickly and effectively to resolve depredation problems. This should enhance the survival chances of nonproblem wolves in Montana and thus contribute to the ultimate recovery of the wolf in the Northern Rocky Mountains.

* * *

Region 8 — Coccidiosis has been diagnosed as the cause of recent deaths of young masked bobwhites (*Colinus virginianus ridgwayi*) being conditioned for release at the Buenos Aires National Wildlife Refuge in southern Arizona. The source of the infection has not been determined, but fecal samples from birds hatched at the Patuxent Wildlife Research Center have been negative. The National Wildlife Health Research Center is assisting refuge personnel in determining the origin of the infection and a course of action for controlling the disease.

* * *

Two gray wolves radio-tagged during September by Patuxent Wildlife Research Center biologists in the Superior National Forest, Minnesota, study area are the fifth generation of wolves in their blood line to be radio-outfitted. Radios have been worn by their mother, grandmother, great-grandfather, and great-great-grandmother. Studies such as these are important to understanding genetic, genealogical, and spatial relationships among wolf packs.

* * *

Mist-netting and banding efforts were intensified in the Mauna Kea, Hawaii, study areas following the completion of the paliia (*Loxioides bailleui*) nesting season. Forty-four of these Endangered birds were captured during September. Nineteen of the birds were mature and 25 were immatures that fledged during the

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Regional News

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past summer. Since January 1988, 104 palilas have been banded in the study areas. This effort by the Patuxent Wildlife Research Center's Hawaiian Field Station is expected to complement ongoing studies of palila nesting success, survivorship, and movement patterns.

* * *

The only known population of the Wyoming toad (*Bufo hemiophrys baxteri*) occurs around a small lake near Laramie, Wyoming. Personnel from the Service (including a National Ecology Research Center biologist), University of Wyoming, and Wyoming Game and Fish Department cooperated in the 1988 population survey. Preliminary results indicate a population of more than 600 individuals, mostly young-of-the-year.

* * *

One of the Service's Office of Information Transfer biologists provided assistance to Region 6 for the third annual survey of a Threatened butterfly, the Pawnee montane skipper (*Hesperia leonardus montana*), in Colorado's Platte River Canyon west of Denver. These surveys are intended to determine a population baseline prior to any possible site preparation activities for the proposed Two Forks Dam project. The 3 years of data indicate a population level of about 82,000 to 116,000, remarkably constant for an insect. Surveys are conducted under the auspices of the Denver Water Department with guidance and direction from a Service Region 8 expert.

BOX SCORE OF LISTINGS AND RECOVERY PLANS

Category	ENDANGERED U.S. Only	ENDANGERED U.S. & Foreign	ENDANGERED Foreign Only	THREATENED U.S. Only	THREATENED U.S. & Foreign	THREATENED Foreign Only	SPECIES* TOTAL	SPECIES WITH PLANS
Mammals	31	19	240	5	2	23	320	24
Birds	61	15	145	7	3	0	231	57
Reptiles	8	7	59	14	4	14	106	22
Amphibians	5	0	8	4	0	0	17	5
Fishes	45	2	11	24	6	0	88	47
Snails	3	0	1	5	0	0	9	7
Clams	31	0	2	0	0	0	33	22
Crustaceans	8	0	0	1	0	0	9	4
Insects	10	0	0	7	0	0	17	12
Arachnids	3	0	0	0	0	0	3	0
Plants	149	6	1	40	6	2	204	84
TOTAL	354	49	467	107	21	39	1037	284 **

Total U.S. Endangered **403**
Total U.S. Threatened **128**
Total U.S. Listed **531**

Recovery Plans approved: 242

*Separate populations of a species that are listed both as Endangered and Threatened are tallied twice. Those species are the leopard, gray wolf, grizzly bear, bald eagle, piping plover, roseate tern, Nile crocodile, green sea turtle, and olive ridley sea turtle. For the purposes of the Endangered Species Act, the term "species" can mean a species, subspecies, or distinct vertebrate population. Several entries also represent entire genera or even families.

**More than one species are covered by some recovery plans, and a few species have separate plans covering different parts of their ranges.

Number of Cooperative Agreements signed with States and Territories: 51 fish & wildlife
January 3, 1989 36 plants

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ENDANGERED SPECIES

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